



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#11/Response
3/14/03
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In re Patent Application of)
Hideaki NINOMIYA et al.)
Serial No. 09/931,717)
Filed: August 20, 2001)
For: METHOD OF SUPPORTING A)
FLEXIBLE SUBSTRATE AND)
METHOD OF MAUFACTURING)
A SEMICONDUCTOR DEVICE)

Art Unit: 2829
Examiner: S. Geyer

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with The United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Commissioner for Patents, Washington, D.C. 20231, on March 3, 2003.

Adele M. Stamper
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RESPONSE

Honorable Commissioner of Patents
Washington, D.C. 20231

Sir:

The Official Action mailed October 2, 2002 has been received and its contents carefully noted. Filed concurrently herewith is a Request for Two Month Extension of Time, which extends the shortened statutory period for response to March 2, 2003. Accordingly, Applicant respectfully submits that this response is being timely filed.

Applicants note with appreciation the consideration of the Information Disclosure Statement filed on August 20, 2001.

Claims 1-34 are pending in the subject application and claims 1-2 and 7-12 are independent. Paragraph 5 of the Official Action rejects claims 1, 2, 4, 6, 27 and 28 as obvious based on the combination of U.S. Patent 6,350,549 to Sakurai and U.S. Patent 5,561,321 to Hirano. Paragraphs 6-13 rejects other claims as obvious based on Sakurai, Hirano and one or more other U.S. Patents. In each case, the Official Action relies primarily on the combination of U.S. Patent 6,350,549 to Sakurai and U.S. Patent 5,561,321 to Hirano in rejecting the pending claims.

As stated in MPEP § 2143-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references

when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." *In re Kotzab*, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Official Action asserts that the pellicle in Sakurai corresponds to the claimed flexible substrate and admits that the frame in Sakurai is not disclosed as having a thermal expansion coefficient less than 10 ppm/degree C. The Official Action cites Hirano for disclosing composite structures with a variety of thermal expansion coefficients. The Official Action admits that Hirano does not disclose the specific claimed coefficient of 10 ppm/degree C. However, the Official Action asserts that Hirano discloses that the thermal expansion coefficient will change depending on the ratio of substances within the composite and that one of skill in the art would find it obvious to select a material having the claimed expansion coefficient.

The Official Action further cites U.S. Patent 5,192,991 to Hosokawa for the disclosure of forming a conductive film by sputtering and U.S. Patent 6,074,893 to Nakata for the disclosure of forming a predetermined pattern of bumps over a substrate by screen printing.

It is respectfully submitted that the Official Action has failed to provide a sufficient showing that one of skill in the art would have been motivated to combine the references to achieve the present invention and that a *prima facie* case of obviousness can thus not be maintained. Specifically, with respect to claim 1, there does not appear to be any motivation to modify the frame of Sakurai to be made from a material disclosed by Hirano and even if such motivation is present, to further modify the material of Hirano to have a thermal expansion coefficient of 10 ppm/degree C.

The Official Action asserts that one of skill in the art would be motivated to combine these references "to achieve the desired properties of a frame which has a thermal

expansion coefficient of such low value that will not disrupt the film substrate attached during a heating step." This, however, appears to be based on improper hindsight gleaned from the present invention, which recognizes and solves a problem associated with disruption of the substrate. The prior art, to the contrary, completely fails to disclose or recognize any problem associated with the thermal expansion coefficient of the frame and the substrate.

Sakurai is not concerned about the frame but rather is focused on the adhesive used to secure the pellicle to the frame. Sakurai does not disclose or suggest any problem with the frame or its thermal expansion coefficient that would have motivated one of skill in the art to look to Hirano. This is further highlighted by the fact that Sakurai is directed to an adhesive for holding a pellicle (i.e. a membrane used to protect light-exposure originals from dust in a photolithographic process) to the frame. The pellicle of Sakurai is completely different from the flexible substrate of the present invention and thus there is no reason to believe that one of skill in the art would have recognized any problem with the frame disclosed in Sakurai.

Furthermore, Hirano merely teaches a ceramic-metal composite material. The Official Action correctly admits that Hirano is silent about the claimed expansion coefficient, but asserts that column 2, lines 43+ of Hirano teaches that the thermal expansion coefficient will change depending on the ratio of substances within the composite. Hirano, however, appears primarily concerned with the relationship of the thermal expansion coefficient of the metal layer disclosed therein to the ceramic body to avoid stress at the interface between the two. Hirano does not disclose how to achieve a material having the claimed thermal expansion coefficient and further does not include any disclosure or suggestion that such material should be used as a frame for holding a pellicle as in Sakurai. Since neither Sakurai nor Hirano recognizes any problem concerning the thermal expansion coefficient of the pellicle frame of Sakurai, there is no motivation to combine the reference teachings to achieve the present invention.

These arguments are even more persuasive for claims such as claim 9, which recites formation of a conductive film on the substrate by a sputtering method. The Official Action cites U.S. Patent 5,192,991 to Hosokawa for the disclosure of forming a conductive film by sputtering. The Official Action asserts it would have been obvious "to apply a coating of conductive film by sputtering on the substrate as taught by Hosokawa to provide


an electrical connection layer to the polymer substrate layer. As taught by Hosokawa, the conductive film serves as an electrode, a crucial part of a semiconductor device for operation and sputtering is a process well known in the art for applying even layered coatings of extremely thin dimensions." The Official Action, however, fails to disclose or suggest any reason why one of skill in the art would need to form such conductive layer on the pellicle of Sakurai. This would appear to completely destroy the functionality of the pellicle, which must be light transparent (Sakurai, column 1, line 38).

Similar arguments can be applied to claim 11 and U.S. Patent 6,074,893 to Nakata. The Official Action asserts that it would have "been obvious to form a predetermined pattern on a substrate by screen printing as taught by Nakata et al. to provide a pattern of bumps for further connection of the substrate a chip or another substrate, as is common in the art." The Official Action, however, fails to discuss why one of skill in the art would be have been motivated to form such pattern of bumps on the pellicle of Sakurai where such action would function to destroy the intended use of the pellicle. Accordingly, it is respectfully submitted that a *prima facie* case of obviousness cannot be maintained.

The Official Action has failed to establish a *prima facie* case of obviousness since there is an insufficient showing that one of skill in the art would have been motivated to combine the reference teachings to achieve the present invention. Favorable reconsideration is requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact Applicant's undersigned attorney at the telephone number listed below.

Respectfully submitted,



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